

REMARKS

Applicants request reconsideration of the above-identified application in view of the following remarks.

Claims 39, 42 and 43 are pending in the present application.

Claims 39, 42 and 43 stand rejected under 35 U.S.C. § 103(a), as being unpatentable over United States patent 6,703,486, ("Mandel"). The Examiner contends that Mandel teaches: (1) a computer for producing a three-dimensional (3-D) representation of binding or active sites of a protein; (2) that such a computer may comprise a variety of programs for 3-D modeling based of atomic or X-ray coordinates; (3) that the data may be carried on computer readable media; and (4) that a monitor may be used to display results. The Examiner further contends that the crystal coordinates recited in the claims do not functionally interact with the computer or the program stored therein, and that the computer or program is not structurally or functionally changed by the coordinates.

The Examiner also contends that according to *In re Gulack*, 703 F.2d 1381, 1385, 217 USPQ 401, 404 (Fed. Cir. 1983) "nonfunctional descriptive material cannot render nonobvious an invention that would have otherwise

been obvious." The Examiner maintains that the structure coordinates are nonfunctional descriptive material, like music or a literary work, which is encoded on computer-readable medium, because "it cannot alter how the machine functions." The Examiner contends that according to *Gulack*, if the data is physically integrated with the claimed device, there is an inherent physical or structural change in the claimed device, but that a "change in data configuration from one set of atomic coordinates to another does not cause any structural or physical change to the computer itself." Applicants traverse and maintain, for all the reasons detailed in their March 2, 2004 and October 28, 2005 Replies to Office Actions, that the structure coordinates recited in the claims should be considered functional descriptive material and be afforded patentable weight. Applicants also traverse, in view of the accompanying Declaration of Dr. Juswinder Singh under 37 C.F.R. § 1.132 (the "Singh Declaration").

Applicants incorporate by reference the arguments set forth in their March 2, 2004 and October 28, 2005 Replies to Office Actions and make the following additional comments.

Applicants disagree with the Examiner's assessment of the structure coordinates recited in the

claims in light of *Gulack*. According to *Gulack*, "[t]he claim must be read as a whole." *In re Gulack*, 703 F.2d at 1385, 217 USPQ at 403. Read as a whole, each of the pending claims relates to a computer for producing a 3-D representation of a *novel* structure, which is sufficiently different from the prior art, and yields novel and useful patentable matter. Furthermore, *Gulack* emphasizes that "the critical question is whether there exists any new and unobvious functional relationship between the printed matter and the substrate." *In re Gulack*, 703 F.2d at 1386, 217 USPQ at 404. Contrary to the Examiner's contention, *Gulack* requires a functional relationship rather than a physical or structural change. Applicants maintain that the structure coordinates of CD40L recited in the pending claims functionally interact with the computer and the programs stored on the computer to create a functional relationship.

In support of this position, applicants submit the Singh Declaration. Dr. Singh is the Associate Director of Computational Drug Design at Biogen Idec Inc., as well as one of the named inventors of the above-identified patent application.

As the Singh Declaration explains, a person of ordinary skill in the art, as of the filing dates of this application and each of the applications to which this

application claims priority, was well aware that a computer, or program contained therein, is functionally changed by the structure coordinates contained within it and that the computer functionally interacts with the structure coordinates (Singh Declaration, paragraph 5).

As set forth in the Singh Declaration, a computer for producing a 3-D representation of a particular protein is capable of acting as a scaffold for use in drug design targeting that particular protein. For example, only a computer with a 3-D representation of CD40L can be used for drug design of that protein (Singh Declaration, paragraph 7). As in *Gulack*, the data (structure coordinates in the current invention) are functionally integrated into the computer to produce a special function computer as a whole, which includes a dynamic three-dimensional representation. Such a computer is functional and is capable of drug design (Singh Declaration, paragraph 11).

The pending application provides, for the first time, computers for producing novel 3-D representations of CD40L (Singh Declaration, paragraph 10). A molecular model of the CD40L for drug design is only possible using the novel coordinates of CD40L first described in this application. Absent those CD40L coordinates, it would not be possible to produce a 3-D representation of CD40L,

nor would it be possible to carry out drug design targeting CD40L (Singh Declaration, paragraph 12).

A computer-readable storage material containing music, a visual art work or printed literary work produces a two dimensional static image that is not manipulated further. In contrast, the structure coordinates integrated with a computer as presently claimed produce a 3-D representation of CD40L, which is dynamic scaffold for interactive drug design (Singh Declaration, paragraph 13). Only a computer with the structural coordinates of CD40L integrated therein can be used for manipulations of that particular protein, such as mutating side chains, changing conformations of amino acids, building ligands into binding pockets and docking molecules into binding sites (Singh Declaration, paragraph 13).

Thus, the computer and set of structure coordinates combine to produce a novel, functional entity that can be used dynamically for drug design targeting CD40L. The computer and structure coordinates have a functional relationship; the coordinates are integrated into the computer, and the computer is functionally changed by those coordinates (Singh Declaration, paragraph 14).

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For all the reasons detailed above, Mandel does not teach or suggest the computers of the present claims. Applicants request reconsideration and allowance of claims 39, 42 and 43, in view of the foregoing remarks and accompanying Singh Declaration.

Respectfully submitted,

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